

What is claimed is:

1. An energy absorbing compound comprising:  
at least greater than 50% by weight of an epoxidized vegetable oil;  
a thermoplastic polymer; and  
a prepolymer.
2. The energy absorbing compound of claim 1, further including an activator.
3. The energy absorbing compound of claim 2, wherein the activator is an alkyl tin compound.
4. The energy absorbing compound of claim 1, wherein the epoxidized vegetable oil is selected from the group consisting of soybean oil, linseed oil, and combinations thereof.
5. The energy absorbing compound of claim 1, wherein the prepolymer comprises an isocyanate selected from the group of aliphatic, cycloaliphatic, araliphatic, aromatic, heterocyclic polyisocyanates and combinations thereof.
6. The energy absorbing compound of claim 1, wherein in the thermoplastic polymer is substantially free of a polyurethane.

7. The energy absorbing compound of claim 1, wherein the thermoplastic polymer comprises a polydiene.

8. The energy absorbing compound of claim 7, wherein the polymer is a polybutadiene.

9. An energy absorbing compound comprising:  
an epoxidized vegetable oil;  
a thermoplastic polymer substantially free of a polyurethane; and  
a prepolymer.

10. The energy absorbing compound of claim 1, further including an activator.

11. The energy absorbing compound of claim 2, wherein the activator is an alkyl tin compound.

12. The energy absorbing compound of claim 1, wherein the epoxidized vegetable oil is selected from the group consisting of soybean oil, linseed oil, and combinations thereof.

13. The energy absorbing compound of claim 1, wherein the prepolymer comprises an isocyanate selected from the group of aliphatic, cycloaliphatic, araliphatic, aromatic, heterocyclic polyisocyanates and combinations thereof.

14. An energy absorbing compound comprising of a percent weight basis of the compound:

at least greater than about 50% of a vegetable based plasticizer;

between about 20% and about 40% of a thermoplastic polymer; and

between about 5% and about 20% of a prepolymer.

15. The energy absorbing compound of claim 13, further including an between about 0.1% to about 5% of an activator.

16. The energy absorbing compound of claim 15, wherein the activator is an alkyl tin compound.

17. The energy absorbing compound of claim 14, wherein the vegetable based plasticizer is selected from the group consisting of soybean oil, linseed oil, and combinations thereof and is in an amount of between about 55% to about 70%.

18. The energy absorbing compound of claim 14, wherein the thermoplastic polymer is substantially free of a polyurethane and is in amount between about 25% to about 35%.

19. The energy absorbing compound of claim 14, wherein the prepolymer is an isocyanate in an amount between about 7% and about 14%.

20. A method of forming an energy absorbing compound comprising:  
combining an epoxidized vegetable oil, a thermoplastic polymer substantially free of polyurethane and a prepolymer to form the energy absorbing compound.

21. The method of claim 20, wherein on a percent weight basis of the compound:

the epoxidized vegetable oil is added in an amount at least greater than about 50%, the thermoplastic polymer is added in amount between about 20% to about 40% and the prepolymer is added in an amount between about 5% to about 20%.

22. A method of forming an energy absorbing compound comprising:  
combining a first component mixture with a second component mixture to form the compound, wherein the first component comprises an epoxidized vegetable oil and a prepolymer and the second component comprises a thermoplastic polymer, an epoxidized vegetable oil and an activator.

23. The method of claim 22, wherein the activator is an alkyl tin compound.

24. The method of claim 22, wherein the epoxidized vegetable oil is selected from the group consisting of soybean oil, linseed oil, and combinations thereof.

25. The method of claim 22, wherein the prepolymer comprises an isocyanate.

26. The method of claim 22, wherein in the thermoplastic polymer is substantially free of a polyurethane.
27. The method of claim 22, wherein the thermoplastic polymer comprises a polybutadiene.
28. An energy absorbing gel comprising:  
an epoxidized vegetable oil;  
a polydiene; and  
a cyano group.
29. The energy absorbing gel of claim 28, wherein the epoxidized vegetable oil is selected from linseed oil, coconut oil, corn oil, castor bean oil, soybean oil and combinations thereof.
30. The energy absorbing gel of claim 28, wherein the polydiene is selected from polybutadiene, polyisoprene, polychloroprene, polynobornene, copolymers, terpolymers and combinations thereof.
31. The energy absorbing gel of claim 28, wherein the gel comprises at least about 50% by weight of the epoxidized vegetable oil.

32. The energy absorbing gel of claim 28, wherein the gel comprises about 20% to about 40% of the polydiene.

33. The energy absorbing gel of claim 28, wherein the cyano group is an isocyanate group.

34. The energy absorbing gel of claim 28, further comprising an alkyl tin compound.

35. The energy absorbing gel of claim 34, wherein the gel comprises up to about 5% by weight of the alkyl tin compound.